What is claimed is:

1. A confocal probe that emits a scanning beam to a target and receives light returned from the target to obtain an image of the target, the confocal probe having a body accommodating an optical system,

the optical system comprising:

an optical fiber through which a light beam is introduced to the optical system;

a converging lens that converges the light beam introduced by the optical fiber;

an optical element having a light incident surface, a first surface and a light emerging surface which statically define an optical path of the light beam; and

a deflecting device mounted on the first surface of the optical element,

wherein the optical fiber, the converging lens and the optical element are secured on an inner wall of the body at predetermined positions, and

wherein the light beam emerged from the converging lens enters the optical element through the light incident surface, the light beam passed through the light incident surface entering the deflecting device through the first surface, the deflecting device dynamically deflecting the light beam incident thereon, the light beam deflected by the deflecting

device being directed to the light emerging surface and emerging therethrough, as the scanning beam, toward the target.

2. The confocal probe according to claim 1, wherein a central axis of the beam incident on the optical element is substantially perpendicular to a normal to the target.

3. The confocal probe according to claim 1, where the optical system further comprises an objective lens that converges the scanning beam on/inside the target.

4. The confocal probe according to claim 3, wherein the objective lens includes an lens element provided on a target side of the optical element.

5. The confocal probe according to claim 4, wherein the lens element and the optical element are made of the same material.

6. The confocal probe according to claim 3, wherein the objective lens includes a diffraction lens structure profiled on the light emerging surface of the optical element.

7. The confocal probe according to claim 3, wherein the deflecting device is arranged at a light incident surface side focal point of the objective lens.

8. The confocal probe according to claim 3, wherein an end surface of the optical fiber and a target side focal point of the objective lens have a conjugate relationship.

9. The confocal probe according to claim 1, wherein the deflecting device is a two-axis type deflector that deflects the light beam such that the scanning beam scans within a two-dimensional area of the target.

10. The confocal probe according to claim 1, wherein the optical element has a second surface, the light beam passed through the light incident surface being incident on one of the first surface and the second surface, then directed to the other of the first surface and the second surface, and then directed to the light emerging surface.

11. The confocal probe according to claim 10, wherein the optical element is a penta prism.

12. The confocal probe according to claim 1, further comprising a second deflecting device,

wherein the optical element has a second surface, on which the second deflecting device is mounted, and

wherein the light beam passed through the light incident

surface is incident on the deflecting device through the first surface, then directed to the second deflector through the second surface, and then directed to the light emerging surface.

13. The confocal probe according to claim 12, wherein the optical element is a penta prism.

14. The confocal probe according to claim 12, wherein the deflecting device and the second deflecting device are one-axis type deflector, deflecting directions of the deflecting device and the second deflecting device being perpendicular to each other.

15. The confocal probe according to claim 14, wherein the optical element is a penta prism.

16. The confocal probe according to claim 1, wherein the optical element includes:

a polarization beam splitting surface arranged between the light incident surface and the deflecting device; and

a $\lambda/4$ plate arranged between the beam splitting surface and the deflecting device,

the light beam incident on the light incident surface being linearly polarized such that the light beam passed through the light incident surface being reflected by the polarization

beam splitting surface, the light beam reflected by the polarization beam splitting surface entering the deflection device through the λ/4 plate, the light beam deflected by the deflection device passing through the λ/4 plate passing through the polarization beam splitting surface and directed to the light emerging surface.

17. The confocal probe according to claim 16, where the optical system further comprises an objective lens that converges the scanning beam on/inside the target.

18. The confocal probe according to claim 17, wherein the objective lens includes a diffraction lens structure profiled on the light emerging surface of the optical element.

19. The confocal probe according to claim 17, wherein the deflecting device is arranged at a light incident surface side focal point of the objective lens.

20. The confocal probe according to claim 17, wherein an end surface of the optical fiber and a target side focal point of the objective lens have a conjugate relationship.

21. The confocal probe according to claim 1, wherein the optical element is a rectangular prism having two surfaces

forming a right angle which serve as the light incident surface and the light emerging surface, respectively, and an oblique surface which serves as the first surface.

22. The confocal probe according to claim 1,

wherein the optical element has a second surface, the light beam passed through the light incident surface being incident on the second surface, directed to the first surface, and then directed to the light emerging surface, and

wherein the optical element is a rectangular prism having two surfaces forming a right angle and an oblique surface, the oblique surface serving as the second surface, one of the two surfaces forming the right angle serving as the light incident surface and the other serving as the first surface, respectively, the oblique surface also serving as the light emerging surface.

23. A confocal probe to be inserted in a human cavity to observe in vivo tissues in the human cavity, the confocal probe introduces a light beam to a target at a location substantially perpendicular to an inserting direction of the confocal probe and receiving light from the target to obtain an image of the target, the confocal probe comprising:

a penta prism arranged in an optical path of the light beam, the penta prism having a first surface and a second surface that bends the optical path substantially in a direction

perpendicular to an direction in which the light beam incident on the penta prism; and

a scanning device mounted on at least one of the first surface and the second surface, the scanning device scanning the light beam on the in vivo tissues in the human cavity.

24. A confocal probe to be inserted in a human cavity to observe in vivo tissues in the human cavity, the confocal probe introduces a light beam to a target at a location substantially perpendicular to an inserting direction of the confocal probe and receiving light from the target to obtain an image of the target, the confocal probe comprising:

a polarization beam splitter having a shape of a rectangular solid, the polarization beam splitter includes:

(a) a light incident surface and light emerging surface;

(b) a polarization beam splitting surface substantially arranged to form an angle of 45 degrees with respect to each of the light incident surface and the light emerging surface;

(c) a predetermined surface on which the light beam is incident via the polarization beam splitting surface, the polarization beam splitter being arranged such that the polarization beam splitting surface substantially inclines, with respect to the direction in which the light beam is incident on the polarization beam splitter, at an angle of 45 degrees;

a polarizing element mounted on the predetermined surface

to change a polarized status of a beam incident thereon; and

a scanning device mounted on the polarizing element, which deflects the light beam passed through the polarizing element to scan on the in vivo tissues,

wherein the light beam incident on the polarization beam splitter is incident on the scanning device through the light incident surface, the polarized beam splitting surface and the polarizing element, the deflected light beam being emerged from the light emerging surface.

25. A confocal probe to be inserted in a human cavity to observe in vivo tissues in the human cavity, the confocal probe introduces a light beam to a target at a location substantially perpendicular to an inserting direction of the confocal probe and receiving light from the target to obtain an image of the target, the confocal probe comprising:

a rectangular prism arranged on an optical path of the light beam, the rectangular prism having a two surfaces perpendicular to each other and an oblique surface intersecting with the two surfaces perpendicular to each other, the light beam incident on the rectangular prism and the light beam emerges from the rectangular prism are substantially perpendicular to each other; and

a scanning device mounted on one of the surfaces of the rectangular prism to deflect the light beam to scan on the in

vivo tissues,

wherein the light beam enters the rectangular prism through one of the two surfaces perpendicular to each other perpendicularly, the light beam entered the rectangular prism being deflected by the scanning device and emerged from the rectangular prism.

26. A confocal probe device, comprising:

a light source that emits a light beam for illuminating a target;

a confocal probe having a body accommodating an optical system,

the optical system comprising:

an optical fiber, the light beam emitted by the light source being introduced to the optical system through the optical fiber;

a converging lens that converges the light beam emitted by the light source and introduced by the optical fiber;

an optical element having a light incident surface, a first surface and a light emerging surface which statically define an optical path of the light beam;

a deflecting device mounted on the first surface of the optical element;

a light receiving element; and

an image signal generating unit,

wherein the optical fiber, the converging lens and the optical element are secured on an inner wall of the body at predetermined positions,

wherein the light beam emerged from the converging lens enters the optical element through the light incident surface, the light beam passed through the light incident surface entering the deflecting device through the first surface, the deflecting device dynamically deflecting the light beam incident thereon, the light beam deflected by the deflecting device being directed to the light emerging surface and emerging therethrough, as the scanning beam, toward the target, and

wherein the light beam converged on the target is reflected thereby, the reflected light beam returning the path of the light beam for illuminating the target and entering the optical fiber, the light beam returned from the target and passed through the optical fiber being received the light receiving element, the image signal generator generating an image signal in accordance with an output of the light receiving element.